

Astronomy

COURSE DESCRIPTION: Why do stars twinkle? Is it possible to fall into a black hole? Will the sun ever stop shining? Since the first glimpse of the night sky, humans have been fascinated with the stars, planets, and universe that surrounds us. This course will introduce students to the study of astronomy, including its history and development, basic scientific laws of motion and gravity, the concepts of modern astronomy, and the methods used by astronomers to learn more about the universe. Additional topics include the solar system, the Milky Way and other galaxies, and the sun and stars. Using online tools, students will examine the life cycle of stars, the properties of planets, and the exploration of space.

COURSE OBJECTIVES:

- Learn about the interactions between the Sun, Earth, and Moon.
- Describe how the motion of the Earth causes seasons and night-day cycles.
- Identify the characteristics and phases of the moon.
- Explore how the moon's gravitational pull manipulates tides on Earth.
- Distinguish between a lunar eclipse and a solar eclipse.
- Describe the study of the cosmos.
- Discuss the theory of the origin of the universe.
- Examine the evidence that supports the Big Bang theory.
- Examine the composition of matter and how it is distributed within the universe.
- Describe the theories of evolution and fate of the universe.
- Describe the composition and characteristics of stars.
- Learn how astronomers identify and describe constellations such as Ursa Major, Ursa Minor, Orion, and Cassiopeia.
- Analyze and characterize stars by their physical and chemical properties.
- Explain the use of diagrams and models in obtaining physical data on stars.
- Examine the evolution of stars.
- Differentiate and describe the types of galaxies within the universe.
- Characterize the Milky Way.
- Identify how galaxies are organized and distributed within the universe.
- Describe the evolution of galaxies.
- Examine the forces that shape galaxies of stars.
- Describe how planetary matter is distributed within the solar system.
- Explain the formation of the solar system.

- Differentiate and describe the inner planets within our solar system.
- Identify the shared characteristics among all inner planets in the solar system.
- Explain the features of Earth that are essential to the development of life.
- Differentiate and describe the unique characteristics of the outer planets in the Solar System.
- Identify the shared features and characteristics among the outer planets in the Solar System.
- Describe the arrangement and distances between the outer planets.
- Explain why Pluto is no longer classified as a true planet of the Solar System.
- Compare and contrast the outer planets with Earth.
- Identify the five regions of the Sun.
- Discuss the structure and composition of the Sun.
- Learn about nuclear fusion in the Sun, including the proton-proton chain reaction.
- Examine solar activity, such as sunspots and solar flares.
- Define and discuss solar eclipses.
- Define comet, asteroid, meteoroid, meteor, and meteorite.
- Examine the origin of comets and how their tails form.
- Discuss the location of asteroids in the Solar System.
- Learn about the different types of meteorites.
- Investigate how comets, asteroids, and meteorites influence life on Earth.

PREREQUISITES: None

COURSE LENGTH: One Semester

REQUIRED TEXT: No required textbook for this course.

MATERIALS LIST: No required materials for this course.

COURSE OUTLINE:

Unit 1: The Earth, Moon, and Sun

Unit 2: The Universe

Unit 3: Stars

Unit 4: Galaxies

Astronomy Midterm Exam

Unit 5: Inner Planets

Unit 6: Outer Planets

Unit 7: The Sun

Unit 8: Comets, Asteroids, and Meteors

Astronomy Final Exam